



UNIVERSITY
OF MANITOBA

CENTRE FOR EARTH
OBSERVATION SCIENCE (CEOS)

567 Wallace Building
125 Dysart Road
Winnipeg, Manitoba
Canada, R3T 2N2
Ph. (204) 474-6981
david.barber@umanitoba.ca

Job Advertisement: The Centre for Earth Observation Science (<http://www.umanitoba.ca/ceos>), Clayton H. Riddell Faculty of Environment, Earth, and Resources, The University of Manitoba, is seeking qualified candidates to fill a position at the Postdoctoral or Research Associate level. This position will become part of a collaborative team working with **Dr. Julienne Stroeve**, the new senior Canada-150 research chair in *climate forcing of sea ice* at the University of Manitoba (<http://www.canada150.chairs-chaires.gc.ca/home-accueil-eng.aspx>)

Candidates are expected to have a PhD or equivalent experience and MSc, in the field of Arctic System Science and in particular in the field of geophysics, remote sensing, modelling, and climate forcing of sea ice. The positions will begin Sept 1, 2018 or as soon thereafter as mutually agreeable.

Sea Ice Thickness Modelling and Remote Sensing - Over the last several decades of continuous observations from satellite passive microwave imagers, scientists have documented a nearly 50% decline in Arctic sea ice extent at the time of the annual summer minimum. Less is known about how thickness and volume are changing, though radar altimeters, such as the one flown on the European Space Agency (ESA)'s CryoSat-2 (CS2) since April 2010, and the SARAL/AltiKa satellite, launched in February 2013 as part of a joint mission by the Centre National d'Etudes Spatiales (CNES) and the Indian Space Research Organization (ISRO), are now providing pan-Arctic (or up to 81.5°N for AltiKa) thickness observations. However, accurate thickness retrievals from radar altimetry requires information on the amount of snow covering the sea ice and consistent knowledge on how far the radar penetrates into the overlying snow cover. The general assumption is that the radar return is from the snow-ice interface at Ku-band (CS2) frequencies, and from the snow-air interface at Ka-band (AltiKa) frequencies, which when combined with assumptions on the amount of snow depth and density, can be converted into total ice thickness assuming hydrostatic equilibrium. However, field evidence has questioned this general assumption, even for a homogeneous snowpack. The objective of this post-doc position will be on modelling snow pack evolution using a snow model, such as the Snow Thermal Model (SNTHERM) forced by atmospheric data to in turn drive a radiative transfer model to estimate how the Ku- and Ka-band scattering horizons and penetration depths vary over time. Particular focus will be on how the transition from an Arctic Ocean dominated by thick multiyear ice with a deeper snowpack, towards a thinner, first-year ice regime with a more saline snowpack influences radar returns at Ku and Ka bands. The position includes opportunities to participate in field programs for validating the modeling approach. The successful candidate will be expected to engage in collaborative science programs with others involved in the C-150 program, manage students, staff and field resources pertinent to the program and to conduct lead authored peer-reviewed research into the field of sea ice remote sensing.

Candidates should send a CV and letter of intent via email to Prof. Julienne Stroeve (j.stroeve@ucl.ac.uk). Pay and benefits are competitive internationally and commensurate with qualifications. **Applications are due by January 1, 2019 and decisions will be by 1 February 2019.**

The University of Manitoba is strongly committed to equity and diversity within its community and especially welcomes applications from women, racialized persons/persons of colour, Indigenous peoples, persons with disabilities, persons of all sexual orientations and genders, and others who may contribute to the further diversification of ideas. All qualified candidates are encouraged to apply; however, Canadian citizens and permanent residents will be given priority. Application materials, including letters of reference, will be handled in accordance with the protection of privacy provision of The Freedom of Information and Protection of Privacy (Manitoba). Please note that curriculum vitae may be provided to participating members of the search process.

